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SOCIETY OF ARTS.

FRIDAY, JULY 8th, 1853.

GENERAL MEETING,

Wednesday, July 6th, 1853.

THE General Meeting for the Election of Officers for the ensuing year was held on Wednesday, July 6th, 1853, Captain Henry C. Owen, R.E., in the chair.

The following Institutions have been taken into Union since the last meeting :

- 273. Bridgend, Mechanics' Institute.
- 274. Allenheads, Library and News' Room.
- 275. Blairgowrie and Rattray, Mechanics' Institution.
- 276. Coalcleugh, Library and News' Room.
- 277. Coventry, Mechanics' Institution.
- 278. Newhouse, Library and News' Room.
- 279. Manchester, Institutional Association of the Literary and Mechanics' Institutions of Lancashire and Cheshire;

and the names of fifteen Candidates for Membership were read.

The following Noblemen and Gentlemen were declared to be duly elected to fill the several offices for the ensuing year. The names in italics were not in last year's list.

PRESIDENT.

H.R.H. PRINCE ALBERT, F.R.S., &c., &c.

VICE-PRESIDENTS.

The Earl of Carlisle	Sir C. Pasley, K.C.B.
The Earl Granville	Joseph Hume, M.P.
The Lord Colborne	<i>William Ewart, M.P.</i>
The Lord Monteagle	<i>William Hutt, M.P.</i>
<i>The Lord Overstone</i>	Samuel Morton Peto, M.P.
Sir John P. Boileau, Bart.	Robert Stephenson, M.P.
The Rt. Hon. T. Milner Gibson, M.P.	Henry Thomas Hope
<i>The Rt. Hon. Henry Tuffnell, M.P.</i>	C. Wentworth Dilke
Sir C. Lemon, Bart. M.P.	J. M. Rendel
	W. Tooke, F.R.S.
	J. Scott Russell, F.R.S.

COUNCIL.

<i>William Bird</i>	Dr. Lyon Playfair, C.B.
Rev. Dr. Booth, F.R.S.	F.R.S.
Harry Chester	W. W. Saunders, F.R.S.
<i>Henry Cole, C.B.</i>	Warren De la Rue, F.R.S.
<i>The Dean of Hereford</i>	Thomas Twining, jun.
<i>J. C. Macdonald</i>	Captain Eardley Wilmot,
Captain H. C. Owen, R.E.	R.A.

TREASURERS.

Thomas Winkworth | *Samuel Redgrave*

AUDITORS.

Peter Graham | *Don Manuel de Ysasi*

SECRETARY.

Peter Le Neve Foster, M.A.

COLLECTOR AND FINANCIAL OFFICER.

S. T. Davenport

NOTICE TO INSTITUTIONS.

THE Council have much gratification in announcing that, pending their negotiations with the publishers, they have received a communication from the Representative of the late Colonel Gurwood, offering to the Institutions in Union copies of the well-known "Despatches of the Duke of Wellington," published at eight guineas in eight volumes, royal octavo, bound in cloth, for four guineas. The Council wish particularly to call attention to this favourable opportunity of obtaining on very liberal terms a work which, they presume to say, should be found in every public library. They will receive orders for the work, which should be accompanied by a Post-office order for four guineas, and will arrange for its prompt transmission.

THE PAPER DUTY.

THE Council having directed an inquiry to be instituted into the operation of the present fiscal restrictions on paper, advertisements, news, and foreign books, the Committee charged with the conduct of that inquiry, issued a series of Queries addressed to the different classes likely to be affected by the operation of the Paper Duty. These queries embodied, as far as possible, all that had previously been urged by writers against the duty, and were designed to test the general accuracy of the complaints thus made. The classes addressed were, 1. Manufacturers. 2. Wholesale Stationers. 3. Manufacturers from Paper and Manufacturers using it. 4. Publishers. 5. Newspaper Proprietors and Editors. 6. Authors. It is proposed, through the Journal of the Society, to draw attention to the valuable evidence which has been collected in answer to these Queries; and as it would be impossible to publish the whole at once, it is intended to give the replies sent in to each set of Queries in the manner which the subjoined will illustrate.

QUERIES PROPOSED BY THE SOCIETY OF ARTS, MAY 4TH, 1853.

No. 1.—To MANUFACTURERS.

1. Does the mode in which the Duty is collected interfere injuriously with the processes of the manufacture, and in what way?

Mr. C. D. COLLET says, "It obliges the manufacturer to dry his paper in order to avoid paying duty on water; the paper, if intended for printing, has to be wetted, and might be rolled from the machine to the printing-press if the law did not interfere."

Mr. W. J. DOWDING says, "Yes; a greater number of hands are kept to weigh and reweigh, and a larger stock is oftener kept than would be, if paper were sold as orders may come in. It has a tendency to holding stocks until after what is called making-up days. Also posting labels on the reams, and the great care to keep charge of same, not to lose any."

Messrs. HASTINGS and MELLOR say, "No; it does not."

Mr. EDMUND SHAW writes, "Yes: inasmuch as many tons are obliged to be returned to the engines to re-make, on account of some slight accident; because

the heavy duty prevents spoiled paper from being disposed of at a low price."

Mr. W. STONES says, "The actual processes are not much interfered with, but some attendant operations very much so. It frequently occurs that a buyer of any given parcel of paper is desirous, for his particular object, to have it more highly glazed; now, as a maker is not allowed to receive paper back into the mill when it has once left, this additional surface can only be given at a considerable expense in London, or, should the maker surreptitiously take it back to the mill, he is liable to a penalty, and to have the paper seized. I have known a maker pay many pounds for glazing one parcel of paper in London, which he could have easily done at his own mill, but he did not wish to incur risk. It sometimes happens that we find, on examination in town, that a parcel of paper has not been sorted so carefully as usual; this error can only be rectified by bringing the overlookers from the mill at great inconvenience, otherwise actual loss is the result from depreciation in the character of the paper. We cannot make envelopes. By not allowing the return of paper to the mill, it is in the power of the receiver to make many frivolous objections to lower the value, knowing it cannot be taken back."

Messrs. P. SUMMERS and SON "use some thousand reams per annum, all of which must be marked when opened, or we are liable to a penalty. In exporting, there is often a great delay in getting the officer here to mark the paper for drawback."

Mr. C. VENABLES says, "It does not interfere with it at all."

Messrs. VENABLES, WILSON, and TYLER say, "The duty on paper is not taken until the manufacture is complete, and the paper is tied up in a cover, and is ready to be sent from the mill. The only way in which it interferes is by requiring the manufacturer to enter in the exciseman's books the different parts of the mill as designed for the different departments of the process: the exciseman seldom exercises the power he has of visiting the different parts of the premises."

Messrs. WELLINGTON and HUTTON (late W. Lechallan), say, "No."

An ANONYMOUS CORRESPONDENT says, "Decidedly not; on the contrary, I think the collection of the duty helps to keep order and regularity in a paper-mill."

2. Does it affect the quality and varieties of the article manufactured?

Mr. C. D. COLLET says, "A duty in weight must have the effect of deteriorating the quality of an article in proportion to its weight."

Mr. W. J. DOWDING says, "Yes; it is different from other trades: we never seem at liberty to introduce anything new, owing to the superintendence continually of the Excise-officer."

Messrs. HASTINGS and MELLOR say, "No."

Mr. EDMUND SHAW says, "It prevents experiments being made with new descriptions of material, because of the loss of duty in case they do not at first succeed."

Mr. W. STONES says, "In the lower sort of papers very materially. The duty on 'browns' being nearly 100 per cent. of the intrinsic value of the paper, it is evident that, speaking roughly, if out of every 4d. half, or 2d., is duty, it must very much narrow the sources of material for such paper. The same remarks apply to cheap writing papers, the very cheapest of which cannot be produced under 7½d.; from this if 2d. be deducted for duty, the actual cost of the article is 5½d.:

allowing that only ½d. of the duty were expended in a better quality of rags, it is evident that for 6d. per lb. a superior article, by 10 per cent., could be produced than is at present for 7½d., and for 7d. as good as is now supplied at 9d. For many educational purposes, and for most general purposes these lower qualities are quite good enough."

Messrs. P. SUMMERS and SON say, "Yes."

Mr. C. VENABLES says, "It does not."

Messrs. VENABLES, WILSON, and TYLER, say, "Not in any way."

Messrs. WELLINGTON and HUTTON say, "No."

An ANONYMOUS CORRESPONDENT says, "No; not in any way."

3. Does it limit materially the quantity of the supply?

Mr. C. D. COLLET says, "Yes."

Mr. W. J. DOWDING "Should think not much; but limits the demand to a very great extent. Such papers as I sometimes sell at 32s. per cwt., nearly 15s. of this is for duty; and if bad debts are made, the duty must be paid the same. It is a gross injustice to make the coarser kinds of paper pay the same as the finest qualities. Hence the difficulty in preventing frauds on the revenue; where this is done it is on the coarser kinds of paper."

Messrs. HASTINGS and MELLOR say, "Inasmuch as it causes an increase in price, it does."

Mr. EDMUND SHAW says, "Very much. If brown and other common papers were about half the price, they would be used for a variety of purposes other than at present, and the manufacture would be vastly increased, and thus in the rural districts employ a great many women."

Mr. WILLIAM STONES says, "Of the lower qualities it does, because the margin for rags and labour is so small; the demand for printing would be much larger in the absence of a duty, and the supply would greatly increase."

Mr. C. VENABLES says, "Certainly not."

Messrs. VENABLES, WILSON, and TYLER say, "We do not consider the mode in which the duty is collected limits the supply in any manner; but, on the contrary, the credit which is given for duty (about two months), is an assistance in capital to the small manufacturer. The duty itself, doubtless, is a check upon consumption, but not to any considerable extent, because the present price of paper is so low as not to make it an object to economize in its use."

Messrs. WELLINGTON and HUTTON say, "No."

An ANONYMOUS CORRESPONDENT says, "No. The supply will be somewhat limited by the scarcity of rags, which the French and other foreign Governments do not permit to be exported to this country; and at the same time an immense exportation of English rags is being carried on, to America and elsewhere."

4. Do the Excise regulations interfere with the rapid execution of orders? and if so, do they neutralize in any degree the power of immediate production, which is the result of improved processes, and of instant delivery, which is the consequence of quick transit?

Mr. C. D. COLLET says, "Yes."

Mr. W. J. DOWDING says, "Yes; my mill being not situate in a market-town, no one ever, or very seldom, thinks of applying to me for an order to be delivered

immediately; as it takes four days to get paper out of the mill, and if a large quantity five days, which is a serious drawback in these days of railway travelling; it shuts us out of certain markets altogether."

Messrs. HASTINGS and MELLOR say, "Yes; and they do interfere very considerably with the delivery of the paper when ready for market, and to a certain extent neutralize the advantage of railway rapidity."

Mr. EDMUND SHAW, says, "Yes, most materially; for instance, at this mill (Colthrop Mill, Thatcham), if an order is sent from London (fifty miles) on Saturday morning, although the paper is tied up ready to send, it cannot be in London *by rail* before *Friday* or *Saturday* following, instead of *Monday morning*, and consequently shipping orders are constantly lost from the delay. It acts thus,—the order received on Sunday, on Monday give forty-eight hours' notice to the Excise to attend and charge on Wednesday; then keep the paper lying in the scales twenty-four hours for the super to re-weigh, making Thursday afternoon before the paper can be moved; if any quantity, it is too late for that afternoon's train, so leaves on Friday, and is in London on Saturday, making a week to deliver an order, and only fifty miles from London. Another case,—a barge with a quantity of paper sank just after it left the mill; the paper could not be brought into the mill again to dry without sending some miles for an officer to view and grant a certificate, and then it was all spoiled and obliged to be worked over again, and the duty not remitted; thus paying twice for the same paper, in addition to loss in value, from 36s. to 5s. per cwt. by water damage. Again, in loading a waggon, by some means two reams got left behind; the super came along and *seized them*, causing a correspondence with the Board (in the meantime the paper to make again), and at last returned upon paying postage 2d.; thus, although paying 8,000*l.* to 10,000*l.* a year duty, accused of fraud, value a few shillings, only because the carter left two reams behind, properly charged, but entered as to go out a few hours earlier. Again, some heavy reams dried a little more than expected, and when the super came round to reweigh, had lost two per cent., or some trifle; and although duty was paid on the full, the paper was seized and *taken away*, causing a correspondence and a ridiculous caution from Head-office, when so far from fraud, an extra amount of duty had been paid. The five per cent. is very oppressive upon heavy makers of common papers; as in the first instance, five per cent. is added to the duty, and then custom of trade allows a discount of 2½, and the cost of labour in weighing and reweighing, &c., is full 2½, making 10 per cent. real cost on the duty; the maker has all the risk of bad debts, besides having to compete with the unfair trader who evades the duty. The duty is nearly one half the amount of the manufactured article in common papers, and more than double the amount of raw material, which is a great temptation to unprincipled makers. The advantage of quick transit by rail is neutralized by the Excise regulations detaining you at least seventy-two hours."

Mr. W. STONES says, "By requiring a long notice before charging, and that the paper must be left in a packed state in the mill twenty-four hours after charging previous to its removal, very much inconvenience is experienced by the maker. I will suppose an order given here to-day for a particular machine paper, no other circumstance than the Excise regulations prevents the paper being made at our mills the same evening, and delivered in town the following day. By the Excise regulations we cannot do so. Thousands of cases

occur annually of paper-makers rendering themselves liable to penalties; some are reported, others are unnoticed by the officers, and in a few cases penalties are inflicted. The inconvenience is to some extent avoided in one of the following manners:—by giving frequent, even daily notices, to charge, the larger portion of which attendances are unnecessary, thus wasting the time of the revenue-officer; and by charging 'Dummies.' Supposing an order is received at a mill on the day of charging for, say ten reams of a particular sort of paper, which cannot be ready until after the departure of the officer, and they cannot be detained until the next charging; ten reams of a similar paper are charged, and the wrappers changed when the required paper is finished, the really charged paper being returned into the uncharged stock."

Messrs. P. SUMMERS and SON say, "Yes; *most decidedly*."

Mr. C. VENABLES says, "The Excise regulations may delay the delivery of paper under any circumstances not more than twenty-four hours."

Messrs. VENABLES, WILSON, and TYLER, say, "We speak practically; that we find little or no interference in the rapid execution of our orders from the Excise regulations; we are always able to know prospectively the time at which paper will be ready to be charged with duty, and on giving notice to the Excise-officer, we find him generally ready to attend at such time, or nearly to it."

Messrs. WELLINGTON and HUTTON say, "Yes; the Excise Laws compel the maker to keep his paper some time after charged by the proper officer, for reweighing by a supervisor in case of need—hence delay."

An ANONYMOUS CORRESPONDENT says, "Neither; by the recent *relaxation* allowed by the Excise, *six hours* is the utmost extent of the detention of paper, and in pressing cases even this may be obviated."

5. Does it prevent the use of new materials in the manufacture?

Mr. C. D. COLLET says, "To a great extent, but not altogether. Straw is beginning to be used, and is even made into *boards* of great strength."

Mr. W. J. DOWDING says, "Yes; I should think so, decidedly. Anything new is often the work of years of study and application, and no one who studied his own interest would apply his mind to such a work much, when he would know by the first post his brains would be carried to any part of the world to use as they might think fit."

Messrs. HASTINGS and MELLOR say, "No."

Mr. EDMUND SHAW says, "Considerably."

Messrs. P. SUMMERS and SON say, "Yes."

Mr. C. VENABLES says, "I have never known it do so."

Messrs. VENABLES, WILSON, and TYLER say, "Not in any manner; there is no interference in the manufacture or in material used."

Messrs. WELLINGTON and HUTTON say, "No."

An ANONYMOUS CORRESPONDENT writes, "Certainly *not*. On the contrary, new materials are being used *DAILY*."

6. Does it place the manufacturer at a disadvantage in the markets, by putting him in the power of customers who are capitalists?

Mr. C. D. COLLET says, "It does, but it would be worse if his customers were not capitalists. The small manufacturers are being driven out of the field,

as would be known if a return were made of the mills given up since 1836."

Mr. W. J. DOWDING says, "Yes. Many a paper-maker has been ruined in this way. He often sends his paper to the wholesale houses to be sold, and when duty-day arrives the capitalist knows it as well as the paper-maker, and he is obliged to submit to anything when once in their hands."

Messrs. HASTINGS and MELLOR say, "It does, where he is short of the capital required for the extent of his business."

Mr. EDMUND SHAW says, "Decidedly so. The duty being paid by the manufacturer immediately, and the customary credit in the trade being four months."

Mr. W. STONES says, "It is only within the last few years that paper-makers have had direct communication with consumers and retailers, the whole of the trade having previously been monopolized by a few wholesale stationers; even at present, there are about seven manufacturers who have London houses, and seven other persons who act as commission agents. A very large number of makers are almost entirely in the power of wholesale stationers, depending upon them for advances to meet the duty. This gives rise to oppression and unfair competition, as it almost compels the maker to accept whatever price the wholesale stationer may put upon his goods."

Messrs. P. SUMMERS and SON say, "Yes."

Mr. C. VENABLES says, "It may have this tendency."

Messrs. VENABLES, WILSON, and TYLER say, "We assert strongly that it does not, at any rate, in the London market. We are not able to speak so well of country places, but we believe not. We consider where a manufacturer is compelled to make a sacrifice to pay his duty, he is not in a situation to carry on his trade if no duty had to be paid."

Messrs. WELLINGTON and HUTTON say, "Somewhat, but to a slight degree only, and in but few cases."

An ANONYMOUS CORRESPONDENT says, "No; I believe a good manager will make the paper duty an assistance to him rather than otherwise."

7. Please to state any facts relative to the above, or any other points bearing on this inquiry.

Mr. C. D. COLLET says, "Many of the manufacturers actually wish the duty kept on, which is a suspicious sign; many more are willing to bear the tax in consideration of the protection given against foreign paper. The absence of the duty would enable us to export large quantities, both as paper and in the shape of books, which might then be sold cheap enough to compete with American books."

Mr. W. J. DOWDING says, "It appears to me to be a bad way of raising revenue in paying men to look after traders, and no doubt dishonest traders pay a good deal to look after the officer; it does appear to be not a very economical mode of doing business."

Messrs. HASTINGS and MELLOR say, "It entails a very considerable expense upon the manufacturer in weighing and reweighing for the duty and otherwise complying with the Excise regulations, such as writing upon each ream, dating, and stamping."

Mr. EDMUND SHAW says, "The 5 per cent. or 9d. per cwt. on the duty is most unjust to the manufacturer of heavy common papers, and is not paid by the consumer, as at the very time the 5 per cent. was added, brown paper fell 2l. per ton. Had the duty been doubled it would have been obtained, but 5 per cent.,

although amounting to a large sum, upon 10,000l. in the year, is too small a proportion to add to the price of the paper."

Messrs. VENABLES, WILSON, and TYLER say, "The removal of Excise duty from an article of such general use as paper cannot but be a desideratum; but it must be borne in mind the supply of the article from which it is made is limited, and should any considerable increase in the manufacture take place, the price of the raw material would be materially advanced. It has been said other articles or materials will be found as a substitute for rags, but after many years' experience in the trial of various substances for this purpose, and under this impression, the conviction is forced upon us that it will be long ere a material is found which will be practically available for the manufacture."

Messrs. WELLINGTON and HUTTON "are not aware that we can say anything further on the subject. The duty is a nuisance to the maker, but possibly not more so than most duties. Should it be repealed, an important matter will be that the dealer, who is generally the holder of a heavy stock, should be allowed the duty thereon, or at any rate upon such portion as had been made within a reasonable time; this is nothing but justice to the holder of large stocks."

In the debate on the Advertisement Duty, Friday, July 1st,

THE CHANCELLOR of the EXCHEQUER said, "The Paper Duty, he was quite ready to admit, was an inexpedient and impolitic tax altogether, because it imposed on the trade of the country a burden totally disproportioned to the amount of revenue received. (Hear, hear.) It interfered with employment throughout the country in a most inconvenient form, because the paper trade, if free, would not be confined to the great centres of population, but would find its way to other localities throughout the country, and diffuse employment among a different class of the population. (Hear, hear.) Therefore the Paper Duty was a tax essentially bad in itself, and, so soon as the state of the Treasury would allow, it ought to be repealed." (Hear, hear.)

DEPARTMENT OF SCIENCE AND ART.

A Library in the Art section of this department, consisting at present of about 2,000 volumes, portfolios of prints, drawings, &c., relating to decorative art and ornamental manufactures of every description, has been established, and is now open daily, mornings and evenings, for the use of students, manufacturers, artisans, and the public in general, subject to the rules of the Department.

"It has," as stated in the prospectus, "its special object, and is emphatically a special library; special in its contents, and peculiar in its administration: its object is to aid in every way the development of taste as applied to industrial art; and the peculiarity of its administration is, that it is made as accessible to the most illiterate as to the best informed."

It has been arranged as nearly as practicable according to the classification of arts and trades adopted in the Great Exhibition of 1851, as that classification has been made, to a certain extent, familiar to the public.

"Its peculiar advantages are these: it is intended to bring together, in the course of time, all works, wherever published, which may in any way illustrate, or aid in the development of, the useful arts in relation to taste, in matters of personal or domestic use, and every variety of social refinement depending on manufacturing skill."

The library is accessible to all on the payment of a small fee, either for the particular occasion, for the month, or for the year.

"Such a library, though special, must eventually become one of great magnitude, and can be only gradually developed; its development will depend much on the use those for whom it is organized may make of it. In its present incipient state much will be required of it that it will not be able to supply; but the knowledge of wants must inevitably precede their supply; all requests will be attended to, and all genuine requirements, as soon as possible, in accordance with the means of the institution. This, however, is certain, that the efficiency of this library rests with the public themselves, and that its growth will be dependent on the use that is made of it."

The Library will be open every day, except the usual vacations at Government offices, from ten in the morning until nine at night, except Saturday evenings.

IMPROVEMENTS IN MACHINERY FOR PRINTING CALICO AND OTHER FABRICS, BY WHICH TEN OR MORE DIFFERENT COLOURS MAY BE WORKED SIMULTANEOUSLY, AND WITH ACCURATE REGISTER.

BY MR. JOHN DALTON, OF HOLLINGWORTH.

AMONG the List of the various subjects for Premiums issued by your Society, and recommended to the study of the public, my attention has been especially directed by your Secretary to the desiderata stated at the head of this Paper. With this subject I, as a Calico Printer, am necessarily familiar; and, deeply impressed with its importance to the trade, have for some time past bestowed upon it my earnest consideration. Desirous of promoting, as far as my humble abilities will tend, the laudable objects of your Society, I have great pleasure in responding to your call, and in laying before you the results of my experience on this head; and I feel confident that I shall be able to show that the difficulties hitherto attending the printing of ten or more colours simultaneously, with an accurate register, may be successfully and simply overcome.

To render this communication the more valuable to the public, I have deemed it desirable to submit to your notice two distinct plans or machines, whereby this result may be arrived at; both indeed involving the same principle, but differing in mechanical details. The chief merit of the first of these plans consists in the simple application of certain improvements to the present arrangement of machinery used for printing ten or more colours, at a cost comparatively trifling, and ultimately resulting in considerable economy, and which improvements will be found equally beneficial when applied to machines for printing single or fewer colours than is stated in your prospectus. Although this latter feature cannot strictly be considered as coming under the title of the present subject, I have nevertheless deemed it worthy of mention, as the promotion of improvements in all branches of industry constitutes the distinctive aim of your Society. The second plan to which I shall afterwards call your attention, will exhibit an entirely novel arrangement of machinery, by means of which a more simple and efficient mode of printing any number of colours will be introduced to the notice of the public.

Before entering on the particular subject of this communication, it will, perhaps, be as well for the clear elucidation of the merits of my Invention if I explain shortly the principle and more important features of the

machines in present use in the several printing establishments of this country, with reference simply to the process of depositing the colour upon the textile fabric, omitting all minor details connected with such machines; such as traverse motion, application of motive power or pressure to the rollers, &c., these being merely mechanical accessories subservient to the more important parts, and differing in the means adopted to produce the same effect. I shall afterwards proceed to point out the causes from which the difficulty of obtaining an accurate register of the pattern arises, and the improvements proposed by me to remove the objection. This course appears the more suitable, as the first of my plans is based upon the present arrangement, and will save a particular explanation when treating of such plan.

The part of the ordinary printing machines whether for single or more colours that first arrests the attention of the observer, is the large pressure cylinder of cast-iron, of a diameter proportioned to the number of colours for which the machine is fitted up. The purpose of this cylinder is to serve as a bed for the textile fabric on its receiving the pressure of the engraved roller. As the metallic nature of the cylinder would present a surface too hard to admit the pressure being effective, it is the universal practice to coil round it several folds of a web termed lapping, composed of woollen weft and linen warp; and in addition to this covering, a thick woollen blanket or endless web is used to carry the textile fabric in its passage round the pressure cylinder, in order to insure a greater evenness and regularity of surface. In apposition to the iron cylinder, the several copper rollers engraved with their respective patterns for each distinctive colour, are arranged in symmetrical order. These engraved rollers are, where the situation will allow, severally furnished with colour-boxes and furnishing rollers, usually made of wood, and covered with vulcanized India-rubber or flannel. The latter serve to distribute the colour evenly in the depressed lines of the engraving.

The excess of colour is removed from the engraved rollers by thin plates of steel called "doctors," which are fastened in metallic plates, and are pressed at a certain angle against the engraved rollers by an adjustment of levers and screws. In order to preserve the fine edge of the "doctors" uniform, a movement in a lateral or transverse direction is communicated to them, as otherwise they would soon be worn uneven from their contact with the metallic roller. This movement is designated the Traverse Motion. Similar steel plates, called "lint doctors," are placed on the opposite side to clear away any particles of lint or loose fibres of the cloth, which would otherwise be carried round to the colour-box and cause inferior work. These last-mentioned "doctors" are adjusted by setting screws to their proper position.

The above is a short outline of the general arrangement existing amongst printers, and will, I trust, be sufficient to give an idea of the nature of the machinery in question, and enable you to comprehend more clearly the effect of my contemplated improvements.

The principal source of objection in this arrangement, it is admitted, arises from the inefficiency of the medium employed to resist the pressure of the engraved roller, namely, the iron cylinder with its folds of lapping and endless web or blanket. It is of primary importance to the attainment of a perfect impression from the engraved roller on the cloth, that the surface of such medium should be perfectly smooth and even, and should also possess a sufficient softness and elasticity to enable the cloth to take up the colour from the depressed lines of the engraving, without being in itself permanently

indented or marked by the pressure. It is a matter of extreme difficulty to obtain these desiderata with the mechanical arrangement explained. Numerous inequalities in the texture of the web, and slight variations in thickness, exist in the newest blankets; and after being a short time subjected to the abrasive action of the machine, accumulations of woollen particles take place, termed in the trade, "flocking." This unevenness of surface necessarily occasions a corresponding variation in the depth of shade produced by the impression, and an omission altogether of the finer lines of the pattern. The wear of the blankets is very rapid, and from the progressive deterioration, an uniformity of impression cannot be depended on. The folds of lapping also wear away very quickly, and are liable to break by force of the pressure employed, thereby causing a break in the impression, and other damage to the work.

The above objections may, to a certain extent, be obviated as regards single coloured machines by unremitting attention and the employment of fine and consequently more expensive blankets; yet when the same arrangement is used with machines printing several colours, a new difficulty arises. Experience shows that the pressure of each engraved roller causes this soft bed of wool to stretch or expand longitudinally, so that when the piece is brought into contact with the subsequent roller, an accurate register of the pattern will not be given unless precautions are taken to compensate exactly for such extension of the web. This extension is not uniform as regards the several rollers, being affected in the greatest degree on coming into contact with the second roller, and diminishing in intensity with each subsequent roller. The variations are further dependent on the particular manufacture and quality of the web used. To compensate for this extension, the engraver requires to be specially instructed to make the second roller of greater diameter, and also a little wider than the preceding one, and the pattern on a corresponding increased scale; and to proportion the size and the engraving of the subsequent rollers in exact conformity to the expected variations in extension.

This allowance necessarily requires a great nicety of calculation, and will seldom prove satisfactory. Again, the rollers thus varying in size must always be employed in the same rotation of order for which they were originally engraved, and the printer is thereby deprived of the advantage of altering the arrangement and diversifying the design by a different combination of the colours, as some colours are obliged to be put on first, and others later in the working series.

From the above remarks, it will be seen that the inefficiency of the present system is attributable solely to the unfitness of the blanket and lapping to afford the proper surface as the medium of resistance to the pressure of the engraved roller. Hence, I have made it my earnest study for some years past to discover some other substance, which I might adopt in substitution of such woollen fabrics, and which would combine in itself the power of resistance without extension, and the essential requirements of permanent smoothness, evenness, and elasticity of surface with ultimate economy. With these desiderata in view, I have been led, from a consideration of the natural properties of gutta percha, which has of late acquired so important a position in all departments of practical science, to make a series of experiments with that material, and I may now venture to congratulate myself on their successful issue. In January, 1850, I brought my labours to a close, and took out a patent for my discovery; since which time I have entirely abandoned the old system in my own works, all my

printing machines being fitted up on the principle hereafter explained.

I will now proceed to explain as concisely as I can the nature and application of my invention with its accompanying advantages, and illustrate it particularly as regards the printing of the number of colours stated in your prospectus. My improvements consist simply in the entire removal from the machine of the iron cylinder with its folds of lapping and blanket, and substituting in their stead a solid bowl or roller of corresponding size constructed with an exterior covering of gutta percha, of at least one inch and a half in thickness. This bowl is manufactured on such a principle as to combine solidity and great resisting power with economy of material, and the mode of its construction is fully detailed in the specification of my said patent.

In the bowls so made will be found united the several qualities which I before stated to be required to constitute a perfect yielding medium, and for which office the present arrangement is shown to be objectionable. I send herewith a model of a bowl, for the machine secondly hereinafter described, made on the scale of four inches to the foot, that you may the more satisfactorily judge of my assertions as to its fitness for the purpose to which I have adapted it, and the advantages attending its use. It will be seen that the surface is quite smooth and even; that the structure is solid and capable of sustaining greater pressure than it would have to endure in printing, and that its elasticity is such as to yield sufficiently to the pressure of the roller and allow the pattern to be impressed on the cloth without the slightest extension of surface. The advantages proved, from experience at my own works, to accrue from the adoption of these improvements can be truthfully enumerated, as embracing the following points: 1st. An uniformity and regularity of impression. The finest pin grounds and the most solid blotch pattern can, with equal facility and distinctness, be printed on the textile fabric. 2ndly. The saving of power. This results from the diminution of pressure required to bring out the engraving, and the smoothness of the face of the bowl. This saving may be calculated at about one-third. 3rdly. The economy of its use considered both as to labour and expense. Under the old system considerable time and labour is constantly taken up, in folding and fastening the lapping round the iron cylinder, in fitting on and renewing fresh blankets when the edges are soiled with colour, and also in washing and dressing the latter. All this labour is saved by my arrangement. In expense, the primary cost of my improvements will not exceed the necessary outlay for the lappings and blankets required by the machine for a single year, allowing two bowls to each machine for a change, in case of accidental injury to the one in use. The expense of maintaining them for future years in their pristine order will not exceed at the most 5*l.* per annum, while the cost of blankets and lappings per machine is estimated by many printers at 150*l.* per annum. In case of accidental injury to the surface of the bowls, they can easily be repaired with a heated iron, as mentioned in my said specification.

The above are features equally valuable for machines printing single or more colours; but in relation to the latter, a further advantage accrues, namely, that of requiring no allowance to be made in the engraving of the several rollers to compensate for extension, and hence of serving to secure an exact register of the design on the fabric.

It is but proper for me to state that the nature of the material precludes its being elevated to a higher temperature than 100° Fahrenheit. At this heat the gutta

percha has a tendency to become soft and plastic, and loses its elasticity, until again reduced to 100° Fahrenheit. This elevation will only arise in this country from neglect in attending to the lubrication of the journals of the mandrills or bowl, or other gross neglect on the part of the workman.

Having thus summarily stated the most striking advantages of my improvements over the old system, I shall proceed to illustrate the working of a machine for printing ten colours simultaneously, based upon the present form of arrangement, and similar to the present machines in all respects, except the adoption therein of my invention. This machine will, I feel confident, fully answer the requirements mentioned in your prospectus.

In the middle of the framework, supporting the different parts of the machine, instead of the usual iron cylinder, lapping, and blanket, one of my patent gutta percha bowls of similar dimensions is placed, and revolves in its bearings. The engraved copper cylinders, serving to produce the particular pattern on the cloth, are all of equal diameter and length, and the pattern is engraved on each without the slightest allowance for extension,—consequently they can be varied at will in order of rotation. These engraved cylinders being hollow, iron mandrills are passed through their respective centres as a support, and the journals revolve in brass steps. Between these steps and the framework a small space is left, so as to allow the engraved cylinder to be moved laterally, and facilitate the fitting-in of the pattern in that direction. This iron mandrill projects beyond the framework on one side, and on it a certain description of wheel, termed a fitting-in wheel, is affixed. The object of these fitting-in wheels is to assist the proper adjustment of the engraved cylinders in their respective positions with regard to the pattern, and maintain them while printing in uniform relation to each other. These fitting-in wheels must be of uniform size, and are constructed of two separate solid divisions; the inner part, or boss, being distinct from the outer rim containing the cogs, and fastened on the iron mandrill by a cotter. To the outer rim a transverse piece of iron is riveted, through which a screw in connection with the inner boss is passed. On turning this screw a corresponding movement is imparted to the engraved roller, independent of the outer rim; and thus the workman is enabled to effect the minutest adjustment of that particular roller in its relation to the others. The screw only allows a slight movement to be given to the roller, but if a greater variation is required, the wheel must be thrown out of gear, and adjusted sufficiently close to be within range of the movement afforded by the screw. The engraved rollers should then be marked with a point, to facilitate their future adjustment. To maintain the several fitting-in wheels in uniform motion, a large intermediate wheel is fixed, revolving on a centre on a level with, but distinct from, the centre of the gutta percha bowl, and to the shaft of this wheel the gearing is connected, imparting motion to the machine. The several engraved cylinders, with the exception of the two lower ones, are pressed against the gutta percha bowl by means of screws and springs enclosed in a box, and the two lower rollers by screws and levers. The engraved cylinders are also, with the exception of the two upper ones, fitted up with colour boxes and furnishing rollers in the ordinary manner. The two upper ones, for want of room, are supplied with what are called “doctor boxes,” combining the “doctor” with the colour box.

Before I proceed to illustrate the working of this machine, I may premise that it will be desirable to

make use of a grey calico underneath the piece, to prevent the edges of the bowl being soiled with colour,—an arrangement in general use with printers using blankets, &c.

The different parts of the machine being adjusted in their respective positions, the calico is brought into contact with the gutta percha bowl, and, as it were, elings to its surface, and, passing on with the revolution of the bowl, receives the pressure of the first engraved cylinder. The elasticity of the surface of the bowl gives way to the pressure sufficiently to enable the depressed lines of the engraving to imprint the colour on the cloth without any consequent depression remaining on the bowl, and as the latter is obviously free from all liability to extension, the cloth remains in exactly the same relative situation when carried in contact with each successive cylinder. Thus when once an accurate adjustment of the several cylinders is obtained, no variation can take place from that cause, and any number of pieces may be printed in constant succession.

I may also add that the efficiency of the bowl is further aided by an electric action which takes place between the gutta percha bowl and the copper roller, while printing. The former, being in a state of positive electricity attracts the colouring matter from the electro-negative roller, and assists its deposit upon the cloth.

From the above remarks, it will be seen that the means by which I propose to obviate the defects existing in the present machines, are extremely simple, merely involving the removal of the cause of such defects, and the substitution of a more efficient medium instead, but I trust that the plan will not on account of its simplicity be deemed less deserving of attention. My object in pointing out these improvements has been to aid, as far as I can, the aim of your Society, and benefit the manufacturing interests of the country, by showing that the means of rendering their present machinery more efficient, are not only accessible to all, but that from their adoption, considerable economy will necessarily result.

Having accomplished this, I now respectfully invite your attention to the consideration of the second plan, which at the outset, I proposed to bring before your notice in connection with the present subject, and which I believe, with due deference, will combine simplicity of arrangement, less expense in construction, and greater efficiency. This machine is based upon the same improved principle that I have introduced to your notice in treating of the former machine, but the mechanical arrangement and details are totally different.

The framework is constructed in three equal divisions, or sections, each division being fitted up with three gutta percha bowls; all these bowls are of equal size, and revolve in brass steps, and are raised when required by large screws. The two outer bowls of each division are pressed upon the engraved cylinders by weights acting with levers against the bearings. The centre bowl is pressed in a similar manner by springs enclosed in a box in connection with the screw. The engraved copper cylinders, fastened on their mandrills, are placed at equal distances horizontally on the framework, so that the pressure from each gutta percha bowl is received by the two copper cylinders revolving in contact with it. Thus, the first engraved cylinder receives the pressure only of the gutta percha bowl, the second cylinder of both bowls, the third cylinder of both bowls, and so on in like manner except the last cylinder, which merely receives the pressure of one bowl. All these engraved cylinders are of the same diameter and width, without the slightest allowance in the engraving for extension.

The journals of the mandrills revolve in brass steps, and on one side of the machine project beyond the framework. On these projecting ends the fitting-in wheels, described in the explanation of the former machine, are fixed, but instead of one intermediate wheel being used as in that machine, a separate intermediate wheel of the same size as the fitting-in wheels moves in connection with each pair of the latter. To each engraved cylinder a furnishing roller is placed in the colour box underneath, and is kept in uniform motion with the cylinder by means of connecting wheels. The traverse or lateral motion required by the colour "doctors" in order to preserve an equal wearing of the edge, is effected by an eccentric movement placed on the extremity of the bearings of the centre gutta percha bowl of each division, which acts by cranks placed on the side of the frame, and connected by a rod and pivot on the "doctor" shears. This arrangement will cause the "doctor" to vibrate slowly from side to side about one inch along the face of the cylinder.

The engraved cylinders being all fitted in, and adjusted to their respective places in relation to the fabric, the machine is set in motion. The cloth progressively unwinding off its roll, passes over rollers and through radiating bars to remove all creases in the fabric, and is then carried on to the first gutta-percha bowl, where it receives the impression of the first colour from the engraved cylinder. Passing on with the revolution of the bowl, it next receives the impression of the second colour from the engraved cylinder by its pressure against the first bowl; and moving with the same engraved cylinder, a second pressure is given to it by the second gutta percha bowl, thus receiving what is technically called two nips with each cylinder, except the first and last. The advantage sought for by this, is to bring out the impression more clearly and forcibly on the fabric; and in case the pressure of the first bowl should chance to be ineffective, the omission will be rectified on its coming into contact with the second bowl. In similar manner the fabric traverses the whole machine, and being printed with ten colours, passes on to the drying stage.

Besides the superiority of impression resulting from the double nip or pressure given to the several engraved cylinders, other important advantages will be gained by my new mechanical arrangement. The machine may at any future period be enlarged, so as to print a still greater number of colours, by merely fitting to it an additional section or division, and thus its capacity of printing any number of colours is unlimited.

The pressure in printing is furnished by the gutta percha bowl, and the engraved cylinders remain steady in their bearings, instead of the reverse being the case, as with the present machines. Hence any casual variation or inequality in the surface will merely affect the pressure bowl, and the relative position of the engraved cylinders will remain undisturbed. With the old arrangement such inequality tends to throw the roller out of its true centre, and the correct fitting in of the pattern is thereby deranged. The pressure being given from above, directly upon each engraved cylinder alike, will also be more steady and regular. The fitting-in wheels and intermediates being all of the same size, must necessarily ensure an uniformity of motion throughout; and any accidental irregularity will only extend to the particular roller with which it is connected. When one large intermediate wheel is used, such irregularity is liable to affect the whole series of cylinders at different points of the design. From the uniformity of motion produced by my arrangement of the fitting-in wheels, a similar uniformity of impression necessarily results, as

every revolution of the cylinders to which they are attached completes the pattern engraved upon them.

I trust that the foregoing explanation will be sufficient to demonstrate satisfactorily the capability of my new machine to attain the object proposed in your List of Premiums, namely, that of printing ten colours with an accurate register. I have made the explanations as concisely as I could, and have forbore entering into minor mechanical details, as these will be well understood by any parties familiar with machinery.

Before I conclude, I feel it due to myself to allude to a circumstance which, although it may appear somewhat irrelevant to the subject of this communication, may serve to remove an erroneous impression from the public mind.

In the year 1851 I exhibited in the Crystal Palace a two-coloured machine for printing simultaneously on both sides of the fabric, an invention of great importance to the trade, particularly applicable to fabrics for handkerchiefs, curtains, blinds, parasols, and other articles, where both sides of the fabric are exposed to view, and it is desirable that they should exactly correspond. This machine exhibited in the most striking manner the same principle as is shown in the machines before explained, and clearly illustrated not only the possibility of producing an impression without the intervention of either lapping or blanket, but the superiority of such impression and the exact register of the pattern from the engraved cylinders. The arrangement consisted simply in the fitting up of two gutta percha bowls of the same size, one directly over the other (though not in contact), each bowl being furnished with two copper cylinders and the other requisite usual appliances. The fabric, after receiving the impression of both engraved rollers attached to the lower gutta percha bowl, crossed between the bowls, and presenting the reverse side to the action of the engraved cylinders working in connection with the upper gutta percha bowl, received a corresponding impression from them.

This machine in every respect fulfilled all the requirements set forth by the Manchester Committee as entitling the inventor to a Prize Medal; namely, novelty of invention, economy in working, and perfection or correctness in workmanship. The novelty was evidenced in the new arrangement of machinery, its application to a purpose never before attempted, that of printing simultaneously on both sides, and in the feature of the fabric receiving the impression from the naked surface of the bowl, without the interposition of any woollen web. The economy in working was established by the dis-use of expensive blankets and lappings, the saving of power effected, and the great durability and facility of repairing the bowls. The machine was made from my design by one of the first makers of printing machinery (the finish and correctness of whose workmanship was undeniable), and was valued at 400*l*.

However, the Jurors of Class 6, whose high office it was to examine with attention and impartiality into, and report upon, the several claims of the exhibitors, and to award to such as might be deemed deserving of notice their respective palm of merit, did not deign to bestow in their Report the slightest recognition of any merit in this machine, nor indeed did they take any notice of it at all; and while thus ignoring my claim, as an inventor, to the meed of approbation to which I was justly entitled, as some acknowledgment of the labour and expense I had devoted in bringing my work to a successful issue, they, with stranger discernment, award an honourable mention to a Mr. Mather, for an eight-coloured printing machine, which was never in fact

exhibited, although it was announced for exhibition in the public papers.

It may seem egotistical in me to make this communication the opportunity for a detail of what I may consider my grievances at the hands of the Jurors of the Great Exhibition; but as I believe that the slight cast upon my invention by their undeserved silence in my regard has been injurious to my interests, by leading the public to consider the principle therein involved, as worthless and impracticable, I have thought it fitting on this occasion, while upholding and showing the application of a similar principle to the objects stated in your prospectus, to represent fairly the circumstances of that neglect, and abide by your verdict as to its justice.

In conclusion, I may add, that the same description of bowls, as I have applied to the purposes of printing, are with similar advantage applicable to other processes intimately connected therewith, as for bleaching, washing, finishing, &c., using them in the place of the ordinary wooden, cotton, paper, or other bowls. For all these purposes, their durability and elasticity of surface render them pre-eminently successful and economical. In bleaching, the resistance of the gutta percha to the action of both acids and alkalies, constitute an important feature. For squeezing, the strong resisting power and elasticity of surface enables them to squeeze out the watery particles more effectively from the fabric. For finishing, their smoothness combined with their other qualities, imparts to the cloth a softer and more mellow finish than can be attained with any other description of bowls.

J. DALTON.

HOME CORRESPONDENCE.

LECTURES.

Huntingdon, June 28th.

SIR,—Will you allow one of the numerous Representatives at the late Conference, who could not get a hearing, to express his sentiments with suitable brevity through the medium of your valuable Journal?

It was manifestly not the fault of the Chairman if many of the Representatives were unheard. That he was full of vigilance and courtesy, all who were present will testify; nevertheless, it so happened that the Representatives of the larger and better known Institutions succeeded in stating their case, and that those who were charged with the advocacy of smaller Societies were not equally fortunate. Yet it is surely in behalf of these that the aid of the Society of Arts is especially required.

The topic on which I, in common with many more, was anxious to speak was, What aid the Society may give to the affiliated Institutions in the important department of LECTURES?

Now, it seems to me clear that a distinct line of demarcation must be drawn between two classes of Institutions, which might, with almost sufficient accuracy, be denominated the *Northern* and the *Southern*.

In the towns, chiefly northern, where manufactures are carried on, it is found that lectures are at a discount. The young men of Oldham, "earnest in their pursuit of knowledge," cry out, "Meagre! Desultory!" and prohibit the "rambling dissertator" from entering their doors. If an Institution in a manufacturing town has lectures at all, they must be on Dr. Lyon Playfair's plan—a *systematic course*, and almost exclusively on those *physical sciences* in which, as manufacturers, the audience will take a deep interest. For the same reason,

while lectures generally fail in those towns, *classes* almost always succeed; and, while science is carefully studied, literature and the fine arts are neglected, if not despised. For these towns, it is evident that scientific lecturers of the first class—"professional lecturers," as Archdeacon Freer said—are needful; and as the Society of Arts is quite competent to supply such lecturers, if only they can be adequately paid, I cannot see any difficulty in accomplishing the object: for flourishing manufacturing towns must surely be able to pay all that might be required. I would suggest, however, that it might possibly do them no harm, if it did not quite save them from the vulgar utilitarianism into which they are now in danger of falling, if an occasional lecture on some topic of literature or the Belles Lettres were even forced down their throats.

But for us who dwell in towns further south, who have not the luck to find in our Institutions or in society around us that high tone of cultivation which distinguishes the young men of Oldham, and who have no manufacturing necessities to make us love physical science more than anything else, a very different regimen seems desirable. We find that *courses* of lectures are pronounced a bore; and that *scientific* courses, above all others, are considered dry and uninteresting, unless enlivened with sparkling experiments, and delivered by men of very popular address. On the whole, those "desultory" dissertations despised at Oldham are found the very best things, if judiciously chosen, to whet the flagging appetite for knowledge. We like to hear George Dawson and Mrs. Balfour, and only wish that lecturers like them could be counted by the dozen. That would satisfy our modest requirements for the present; for hitherto we have had to choose between ignorant and conceited adventurers, who would "do the thing cheap," and only succeeded in exciting our spleen, and "professional lecturers," full of hard words and dry disquisitions, who indeed proved their own learning, but, alas! emptied both our lecture-room and our purse. In such a wretched dilemma we have been fain to have no lectures at all.

What I have, therefore, to crave is, that in making provision for our Lecture-rooms, the Society of Arts will kindly take into consideration the entirely different standing and position of the Institutions in the North and in the South. I remain, Sir,

Your obedient Servant,

JAMES HENRY MILLARD.

LOCKS.

SIR,—I have never seen a more unfortunate attempt at getting out of a scrape, than the anonymous letter in the Journal last week, written almost avowedly by some member of that sagacious Committee which gave a Medal and something more to the inventor of a lock, which Mr. Hobbs has shown to possess the two qualities of antiquity and good-for-nothingness in an eminent degree.

They now pretend, at least their advocate does for them, that they understood—nay, that "it is evident, that what the Society desired was a good *common* lock." If so, do they think the Society could not have said so? If so, why did the Society say something as different as possible? If it is so evident, why does P. L. O. take so much pains to explain that the expression "great security" in the Premium List, must be understood to mean only as great security as you can expect for half-a-crown? The Prize List said nothing about half-a-crown, and did specify "great strength and security from fraudulent attempts," and also from "disarrangement

by dirt," and that the lock was only to require a small key.

To anybody but Mr. Chubb and his Committee, this rather particular description must have suggested anything rather than a cheap common lock; but it did not to them,—at least so they assure us now. The fraudulent attempts, we are told, could not be supposed to have any reference to banker's safes, because you cannot expect a good bank lock for the price of a good common lock; and a common lock, we know, is the thing the Society meant to look for. And therefore it is evident that the fraudulent attempts the Society had in view were the attempts of "the idle and mischievous" on "the store-room or apple-loft."

The freedom from "disarrangement by dirt" required by the Society's conditions, could not possibly suggest to the intelligent minds of Mr. Chubb's committee the idea of one of Mr. Chubb's locks having to be broken open on account of two of the tumblers having got stuck together,—Mr. Chubb, of course, never heard of such a thing. The expression no doubt suggested to them only the idea of a mischievous boy stuffing dirt into the lock of the aforesaid store-room, or apple-loft, by way of paying off the owner for being so ill-natured as not to leave it open.

"No one expected, as the result of the Society's premium," they say, "an unpickable bank lock for five shillings." Probably not: but there is a widish margin left between an unpickable bank lock for five shillings, and Mr. Chubb's pickable one for five pounds or thereabouts. If the Committee had no lock presented to them, which (as far as they could judge) did "possess great strength and security from fraudulent attempts, freedom from disarrangement by dirt, requiring only a small (that is, of course, a light) key, and cheap" for a lock possessing those qualities, which is the only rational meaning of the word, they had nothing to do but so to report to the Council. Or, if Mr. Chubb's committee did not choose to give any encouragement to a lock which might be likely to interfere with Mr. Chubb's locks, they might have given no premium at all, with at least as much credit to themselves as they have obtained by what they have done. Or, if they really meant to reward Mr. Saxby for cheapening the construction of an old lock, they might have done so, taking care to inform the public what their reward was for.

They did none of these things; but committed the gross blunder so properly and promptly exposed by Mr. Hobbs. And they now add to it the much grosser and more discreditable blunder of attempting to disguise it, by an excuse which everybody can see is a pure *ex post facto* invention from beginning to end. I think it due to the credit of the Society to expose such a proceeding as it deserves. If P. L. O. had put his name to his defence of himself and his colleagues, he should have had mine to this answer to it. As he has not, I take leave to subscribe myself,

O. P. Q.

LOCKS.

Tiverton, July 2nd, 1853.

SIR,—I should be sorry unnecessarily to trespass upon your columns; but the fact of the lock of Mr. Saxby, for which the Medal was awarded by the Council of your Society, having been proved by the successful experiment of Mr. Hobbs to be even ludicrously unsafe, renders it imperative on me, having been a competitor with Mr. Saxby for the Prize, to take this public means of disabusing the minds of the many persons at present cognisant of, or who may hereafter be acquainted with, the fact of my having so competed, of an opinion they must

naturally form from the premises:—That the lock considered by the Committee to be the most deserving of the Prize having been shown to be utterly untrustworthy, mine consequently was in all likelihood equally, or supposing such a circumstance possible, still more insecure. That such is not the case, and that in this instance the Committee have in their desire to introduce a *cheap lock* attached too little importance to the still more requisite element of *perfect security*, I will (in order to vindicate the reputation of my lock from the stigma which must otherwise, in consequence of this error on the part of the Committee, rest upon it) venture to demonstrate in a manner at once conclusive and unquestionable, and which, under the present circumstances cannot, I think, be considered objectionable. I submitted it to the decision and criticism of the Society in the full confidence, not only that it would prove to be a "cheap lock," but that it was not possible, by any amount of skill or perseverance, to succeed in picking it. In such belief I still continue; and in order to convince my friends and the public that the decision in Mr. Saxby's favour was not owing to any want of security in mine, I herewith publish my intention of placing the sum of 100*l.* in the hands of a banker, to be handed by him over to Mr. Hobbs, should he succeed within the next three months in picking the patented lock of my construction, which was placed before your Society in competition for the Prize. On receiving notice from Mr. Hobbs, through your Journal, of his intention to make the attempt, I will at once commence fixing it in a manner suitable for the experiment; on the completion of which, he shall be at liberty to examine a lock constructed on the same principle, that he may acquaint himself with its peculiarities, after which I will allow him ten days in which to effect his purpose: conditioning solely, that either myself or some person appointed by me, shall, if I shall so require it, be present during the operations, to prevent violence or injury to the lock. No other sufficient means being open to me but the present of removing whatever prejudice may have been created against my invention, by the erroneous decision of the Lock Committee, must be my excuse for thus occupying your space. I am, Sir,

Yours respectfully,

W. H. TUCKER.

MR. SAXBY'S LOCK.

"Faith! here's an equivocator!"—*Shakspeare.*

SIR,—Had your correspondent P. L. O. really afforded the "explanation and reply" promised in his opening paragraph, I should scarcely have troubled you with a rejoinder to his observations. Either I am not so "acute" as his flattering designation would lead me to suppose, or his "explanation" must be deficient in point and clearness; for I can neither see that it justifies the Committee on Locks, by whom the premium was awarded to Mr. Saxby, or that it corrects my opinion concerning the requisitions of the Society.

Not to occupy your space unnecessarily, I will simply repeat the words of the proposal made by the Society, and submit my own understanding of them for comparison with the judgment of P. L. O. The offer was made for "the invention of a good and cheap lock, combining strength and great security from fraudulent attempts; cheapness, freedom from derangement by dirt, and requiring only a small key." I supposed the above to mean that a lock was to be produced either on a new principle or by the arrangement of some principle already known, which should combine with as much strength as any lock now in use, as great or

greater security, and yet be capable of manufacture at a lower price for the various purposes for which locks are required, and should require only a small key. If I am not mistaken in the plain import of the language, I may venture to repeat that the lock for which the Committee have awarded the premium of the Society does not in the most distant manner come up to the requisitions. Instead of its being either a new principle or a new arrangement, it is precisely the same *both in principle and arrangement* as the Cotterill lock, without the slightest modification, in fact, only differing from it in the inferiority of its workmanship. It is less secure than either a Bramah or a tumbler lock of the same cost, and is quite as liable to be deranged by dirt. It requires a key of the same size as the Bramah and other locks.

I make no comment upon the wisdom of supposing that the Society intended to award a premium for the means of securing P. L. O.'s "apple-loft" from the pilfering propensities of his naughty boys; the words are for *great security from fraudulent attempts*, and they need no commentary to make them plainer.

In conclusion, it would give me great pleasure to be afforded an opportunity of proving the correctness of my statement to the Society by a comparison of the different kinds of locks now in use. I am prepared to prove also that as good a lock cannot be produced by Mr. Saxby for half-a-crown as by Cotterill for 10s. In regard to "professional lock-picking," I will undertake to show that Mr. Saxby's lock can be easily opened and locked again, not by the application of extraordinary skill or anything so profound as "systematic ingenuity;" but by *a bent nail and a bit of wire*, or by a key made by a piece of pine wood; in a word, that the principle of Mr. Saxby's lock is neither secure for the "store-room, the apple-loft, nor the banker's safe;" that it is not "much more secure than common locks;" and that it cannot be produced at a lower price than "really good locks." This proposition being distinctly understood, your correspondent P. L. O. will have some difficulty in satisfying either the Society of Arts or the public that the Committee on Locks have not committed a very ridiculous blunder.

Respectfully yours,

A. C. HOBBS.

97, Cheapside, July 5th, 1853.

CHRONOMETERS.

SIR,—Observing that Mr. Denison's object, in the discussion concerning chronometers, is to misrepresent everything connected with the subject, it is not my intention to take any further notice of his remarks.

Yours, &c.,

London, July 5.

E. T. LOSEBY.

* We must now close this discussion. Both parties appeal to the same documents in support of their views. Those interested in these matters must draw their own conclusions from them.—ED. J. OF S. A.]

TO CORRESPONDENTS.

In answer to several inquiries, the Secretary begs to state, that when any donation of books is made to the Society for distribution among the Institutions in Union, the fact is notified in the Journal immediately; and should the number of copies be limited, the Institutions desirous of possessing a copy of any particular work are requested to apply for it. These applications are registered immediately on their receipt, and the books are sent in the next parcel: it being thought preferable, in order to avoid unnecessary expense, not to send each work separately, but to detain them until several are collected.

Want of space prevents the publication this week of the usual

list of Parliamentary Papers. Also letters from Mr. R. A. Slaney, on "Cottager's Wells;" from * * * *, on "Lecturers, Lectures, and Apparatus;" and from Mr. Thomas Restell, on "Locks;" as well as a notice of the Allenheads' Library.

PATENT LAW AMENDMENT ACT, 1852.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

From Gazette, 1st July, 1853.

Dated 7th May, 1853.

1131. C. W. Finzel—Refining sugar.

Dated 10th May.

1141. F. Lipscombe—Obtaining motive power.

1151. J. H. Johnson—Apparatus for agricultural operations. (A communication.)

Dated 26th May.

1301. J. Nurse—Fastening and unfastening doors, specially applicable to carriages.

Dated 27th May.

1309. W. W. Bonney—Machinery for raising a pile by abrasion on cotton, linen, &c. fabrics.

Dated 28th May.

1313. E. Nash and J. Nash—Manufacture of wicks.

Dated 1st June.

1343. J. W. Thomson—Heating hothouses, &c., houses, churches, &c.

Dated 3rd June.

1364. J. Mayelston—Manufacture and refining of sugar.

Dated 15th June.

1445. A. Parsey—Revolving engine by steam, air, gases, or water.

1449. C. W. Williams—Manufacture of sheet-iron, &c., for boilers, vessels, &c.

1451. J. Dehan—Manufacture of yarn, and fabricating articles therefrom.

1453. J. Dilkes and E. Turner—Door-springs.

1455. W. Gossage—Obtaining certain saline compounds from solutions.

1457. T. Z. L. Maurel—Horological alarms.

Dated 16th June.

1449. E. Walmsley and J. Holmes—Improvements in steam-engines.

1461. W. Christopher and G. Gidley—Abstracting sulphur, &c., from vulcanized India-rubber.

1463. J. W. Gibson—New pavement for roads.

1465. J. Ilsley—Telegraphic apparatus.

1467. P. A. L. C. de Fontainemoreau—Process for preserving milk, &c. (A communication.)

1469. C. Roosevelt—Reducing friction of journals of railway and other carriages, &c.

1471. B. Finch—Apparatus for supplying steam-boilers with water.

1473. S. Solomon and S. Mills—Axle-boxes for locomotives, &c.

Dated 17th June.

1474. E. Rodgers—Looms for weaving.

1475. C. and E. Wand and W. Busfield—Preparing wool and other fibrous substances.

1476. A. E. L. Belford—Machinery for pulverizing, &c., quartz or ore, and amalgamating gold therein. (A communication.)

1477. A. E. L. Belford—Improved stove or kiln.

1478. R. Lister—Chimney-tops or flues.

1479. H. and J. Bleasdale—Working, tilling, and preparing land.

1481. J. Piddington—Obtaining infusions, &c., and vessels for same. (A communication.)

Dated 18th June.

1482. W. Hall—Shipbuilding.

1483. H. Bessemer—Waterproof fabrics.

1484. H. Saunders—Drying grass and other crops.

1486. E. Breffit—Manufacture of glasshouse pots.

1488. T. and W. Adamson—Pumps.

1489. J. and J. Heginbottom—Spinning.

1490. J. Shanks—Alkali from common salt.

1492. W. A. Gilbee—Ornamenting stuffs and paper. (A communication.)

1493. J. Worrall—Machinery for washing, bleaching, and dyeing fustians, &c., and other textile fabrics.

1494. J. C. Richardson—Machinery for winding yarn.

1495. J. C. Richardson—Looms for weaving.

1496. G. Robinson—Apparatus for roasting coffee, &c.

1497. S. Schofield—Machinery for preparing and spinning cotton, &c.

1498. G. Young—Grinding wheat, &c.

Dated 20th June.

1499. C. Crickmay—Fire-arms.

1500. J. Paul—Colouring paper on the surface.

1501. R. Midgley—Preparing and finishing worsted yarns, and apparatus for same.

1502. H. Barker and F. Holt—Machinery for grinding and turning metals.
 1503. W. Boggett and G. B. Pettit—Dioptric reflectors.
 1504. W. and H. Hodgson—Machinery for spinning wool, hair, &c.
 1505. J. W. Perkins—Manufacture of artificial manure.
 1506. W. E. Newton—Machinery for drilling or boring rocks, &c. (A communication.)
 1507. W. E. Newton—Manufacture of handles for knives, &c. (A communication.)
 1508. C. L. Defever—Preparation for lubricating machinery.
 1509. R. Cornelius—Construction of churns for butter.
 1511. A. Macpherson—Disinfecting sewers, &c., and converting contents to useful purposes.
 1513. P. Grimand—New aérogaseous drink, called "Grimandine."
 1514. H. Blatin—Buckles.

Dated 21st June.

1515. C. Cowper—Cards or substitutes for cards for Jacquard loom. (A communication.)
 1516. J. Newton—Apparatus for heating buildings, applicable to horticultural purposes, hatching and rearing game, &c.
 1517. T. Wilson—Screens for cleaning wheat, &c.
 1518. J. Drummond—Reaping-machine.

Dated 22nd June.

1521. J. H. Noone—Stopping trains and preventing accidents.
 1522. F. Ayekbourn—Waterproof fabrics.
 1523. F. Huckvale—Hand hoes.
 1524. W. Geeves—Manufacture of bricks.
 1525. C. Topham—Apparatus for measuring liquids, gases, &c., and for regulating the flow, applicable to obtaining motive power.

APPLICATION WITH COMPLETE SPECIFICATION FILED.

1548. A. Andraud—Railways and locomotives for facilitating ascent of steep inclines. 25th June, 1853.

WEEKLY LIST OF PATENTS SEALED.

Sealed 1st July, 1853.

- Year, 1852 :
 955. William Keates, of Messrs. Newton, Keates, and Co., Liverpool—Improvements in fire-boxes for locomotives and other steam-boilers.
 Year, 1853 :
 9. Matthew Tomlinson, of Hulme, Manchester—Improvements in the manufacture of species-jars or show-jars.
 19. George Gwynne, of Hyde-park Square, and George Ferguson Wilson, of Belmont, Vauxhall—Improvements in treating fatty and oily matters.
 21. Jean Baptiste Pascal, of Lyons, and 16, Castle-street, Holborn—Improvements in obtaining motive power.
 28. Lieutenant Herbert Newton Penrice, R.E., of Sheffield—Improvements in propelling vessels.
 215. Joseph Scott, of Glasgow—Improvements in closing or stoppering bottles, jars, and other receptacles.
 253. John Mason, of Rochdale—Improvements in looms for weaving.
 541. John Wright, of Camberwell—Improvements in machinery for manufacturing bags or envelopes of paper, calico, or textile fabrics.
 581. Jacques Frangisque Pinel, of Pall-mall—Improvements in deodorising sewage water and cesspools, and in manufacturing manures.
 820. John Thomas, of Caen, France—Improvements in apparatus for the manufacturing of gas and coke.
 969. James Davis, of Hemel Hempstead—Improvements in the manufacture of threshing-machines.
 970. William Sager, of Seacombe, Chester—Improvements in machinery or apparatus for propelling vessels.
 974. Cyprien Marie Tessie de Motay, of 24, Rue Fontaine St. George, Paris—Improvements in preparing oils, and in apparatus for burning the same.

Sealed 4th July, 1853.

Year, 1853 :

17. Joseph James Welch and John Stewart Margetson, of Cheapside—Improvements in the manufacture of travelling-cases, wrappers, and certain articles of dress, hitherto manufactured of leather.

Sealed 5th July, 1853.

20. William Edward Newton, of 66, Chancery-lane—Improvements in atmospheric engines. (A communication.)
 24. Thomas Shilton, of Baddesley, Ensor, Warwickshire—Improvements in weighing-machines.
 25. Charles Frederick Whitworth, of Brighton—Improvements in apparatus to be used in connection with railway-signals, for the purpose of indicating the approach of trains, and of preventing collisions.
 30. Emile Grillet, of Soho-square—Improvements in renewing the teeth of files.
 45. Thomas Pape, of Loughborough—Improvements in circular frames, and in the fabrics and articles produced thereon.
 70. William Weild, of Manchester—Improvements in looms for weaving.
 80. James Fletcher, of Facit, near Rochdale—Improvements in machinery applicable to spinning, doubling, and winding of cotton, wool, flax, silk, and other fibrous materials.
 251. Louis Guillaume Perreux, of Paris—Improvements in machinery or apparatus for testing and ascertaining the strength of yarn, thread, wire strings, or fabrics.
 472. Thomas Browne Jordan, of New Cross, Kent—Improvements in machinery for planing slate.
 602. Edward Maitland Stapley, of Lawrence-lane, City—Improvements in machinery for breaking and dressing flax and other fibrous materials. (A communication.)
 880. Francois Felix Verdie, of Lorette, Loire, France—Improvements in welding cast steel with iron, steel, cast iron, and other metals.
 943. Frederick Henry Smith, of 264, Borough of Southwark—Improvements in apparatus for cleansing the interior of tubular boilers and other hollow articles.
 1032. Peter Fairbairn, of Leeds, and Ferdinand Kaselowsky, of Berlin—Improvements in machinery for drawing, roving, and spinning flax, hemp, and other fibrous substances.
 1075. Richard Quin, of 5, Rodney-street, Pentonville—Improvements in the manufacture of cases for jewellery, for optical and other instruments, miniatures, and other articles.
 1096. Thomas Taylor, of the Patent Saw-mills, Manchester—Improvements in apparatus for measuring and for governing the flow of water and other liquids.
 1097. William Edward Newton, of 66, Chancery-lane—Improvements in apparatus for rolling iron. (A communication.)
 1130. William Boggett, of St. Martin's-lane, and George Brooks Pettit, of Lisle-street, Westminster—Improvements in apparatus for heating by gas.
 1147. Robert Brown, of 58, Waterloo-road, Liverpool—Improvements in lifting and forcing water and other fluids.
 1157. Samuel Cunliffe Lister, of Manningham, Yorkshire—Improvements in treating and preparing before being spun wool, cotton, and other fibrous materials.
 1175. Joseph Denton, of Prestwich—Improvements in machinery or apparatus for manufacturing looped, terry, or other similar fabrics.
 1181. George Bertram, of the firm of William and George Bertram, of Edinburgh—Improvements in the manufacture of paper.
 1184. Charles Tetley, of Skinner-street—Improvements in rotary engines.
 1196. Herman Dirs Mertens, of Margate—Improvements in preparing materials to be employed in making beer and other beverages.
 1207. Jean Emile Barse, of Paris—Improvements in the manufacture of grease or composition for lubricating the axles and moving parts of machinery.

WEEKLY LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

Date of Registration.	No. in the Register.	Title.	Proprietor's Name.	Address.
July 1	3480	Portable Combined Chair and Couch.	James Ross Murphy and Patrick Murphy, trading under the name or style of E. Ross.	Dublin.
" "	3481	Joint for Bedsteads.	Duncan M'Laren and John Scott Oliver, trading under the firm of M'Laren, Oliver, and Co.	329, High-street, Edinburgh.
" 5	3482	A Calendar, or apparatus for indicating the month, the day of the week, and the day of the month.	Thomas De la Rue and Co.	Bunhill-row.